APPAREL WORN FOR THE AID AND PROTECTION OF THE BODY AND FOR THE SUPPORT AND ASSISTANCE OF IMPAIRED JOINT FUNCTION

BACKGROUND

Field of Art

This invention relates generally to orthopedic support prosthesis and more particularly to mechanical joints and supports for ankles, elbows, knees, and wrists, and the like. Active persons such as runners, football players, soccer players and skiers as well as ordinary citizens frequently suffer injuries to a variety of joints. Knee, ankle, wrist, elbow, and neck dislocation and sprains are common. Once injured a joint may suffer lasting residual effects and subject the injured person to a chronic condition in which the joint may dislocate, or sprain again when placed under unusual stress. Such a condition frequently requires the injured person to use some sort of protective device when unusual stresses are anticipated such as participation in athletic events. Indeed, a restriction of normal movement is frequently part of the treatment of an injured joint. Such a protective prothesis device can limit movement of the injured joint permitting more rapid healing and recovery.

Previous devices have usually used pivoted hinged frameworks, or devices which attach as their free ends to bands or cuffs, or are inserted into an elastic sleeve. While such devices may provide some lateral support the amount of lateral support is a function primarily of the rigidity of the device and especially the design of the pivot and pivot pin. Furthermore, prior art does not provide a convenient means whereby the degree of allowable movement in the plane of articulation may be adjusted or controlled.

VALIN, U.S. Pat. No. 4,064,874 described a knee joint support device having articulated lateral supports. The degree of rigidity of VALIN'S device is limited by the surface area of matching tongue portions and the size of the flat head rivets. Furthermore, VALIN does not provide any means for controlling, limiting or restricting motion in the plane of articulation of the joint.

It is an objective of the present invention to provide a supporting device for joints which is highly resistive to lateral forces and movements, and provides a means for controlling or restricting movement in the plane of articulation.

SUMMARY

The invention is a brace member having a base, and a plurality of crescent shaped discs, and an end piece. The base has a convex semi-circular end with a T-shaped groove. The first crescent shaped disc has a T-shaped tongue on its concave side, as do all other discs, which slideably fits into the T-shaped groove on the base. The first crescent shaped disc has a T-shaped groove on its convex side, as do all other discs, which slideably accepts the T-shaped tongue of the second crescent shaped disc. Any desired number of crescent shaped discs can be interlocked, chain fashion, to achieve the desired length of the brace. The end piece has a concave semi-circular surface which is a T-shaped tongue, and which slideably interconnects to the last crescent shaped disc. The geometry of T-shaped, semi-circular tongue and groove interlockings, and the geometry of a rigid arc between interlocking discs, combined with the increased contacting surface area between crescent shaped discs provides substantially improved resistance to lateral forces and movement of the joint.

The base member, and each crescent shaped disc, are provided with stop blocks which slide into the T-shaped groove. The stop blocks have a set screw which is screwed into the base of the T-shaped groove wedging the stop block in the T-shaped groove. Thus by properly adjusting the stop blocks in the base member and the crescent shaped discs, the movement in the plane of articulation can be limited or restricted, even can be eliminated.

The invention in various sized, utilizing any convenient attaching device such as a brace bar, cuffs, or elastic sleeve can obviously be used on ankles, wrists, elbows, knees, and could be adapted for use with the neck or torso of a person.

BRIEF DESCRIPTION OF DRAWINGS

FIG. **1** is an isometric view of the invention.

FIG. **2** is a plan view of a crescent shaped disc.

FIG. **3** is a sectional view of a crescent shaped disc cut on **3**—**3** of FIG. **2**.

FIG. **4** is an isometric view of the invention with attachment means.

FIG. **5** is a partial sectional of the base member cut on **5**—**5** of FIG. **4**.

FIG. **6** is an isometric view of the invention with means for aiding joint dysfunction by spring energizing.

FIG. **7** is a partial sectional view of a crescent shaped disc cut on **7**—**7** of FIG. **6**.

FIG. **8** is an illustration of the application of the invention on an ankle of the wearer.

FIG. **9** is an illustration of the application of an invention on the palm side of the wrist of the wearer.

FIG. **10** is an illustration of the application of the invention on the knee of the wearer.

FIG. **11** is an illustration of the application of the invention of the thorax of the wearer.

DESCRIPTION OF PREFERRED EMBODIMENT

Refering to the drawings, FIG. **1** shows the invention to consist of a base member **1**, a plurality of crescent shaped disc **2**, and an end piece **3**.

The base member **1** is generally flat, and has a rectangular attaching end **4** and a convex semi-circular end **5** whose radius is approximately equal to the width of the attaching end **4**. The attaching end **4** can be equipped with any convenient means of attaching to a bar, cuff or straps as desired such as but not limited to slots or rivet holes. If the invention is to be inserted into a pocket in an elastic sleeve, the attaching end **4** need only be smoothed and without corners to prevent chafing of the wearer, or snagging and tearing the elastic sleeve. The semi-circular end **5** of the base member **1** is shown to have a T-shaped groove **9** in the edge.

The crescent shaped discs **2**, are generally flat and all identical. Each crescent shaped disc **2** has a concave edge **12** and a convex edge **13**. The concave edge **12** has a cross-sectional shaped in the form of a T-tongue **14**, which is sized to slideably fit the T-shaped groove **9**. The convex edge **13** has a cross-section of a T-shaped groove **9**. The convex edge **13** and concave edge **12** of the crescent discs **2** are circular arcs whose radius is approximately equal to the radius of the semi-circular end of the base member **1**.

The end piece **3** is generally flat, and is shown to have a rectangular attaching end **6** which is generally the